

# **Section K**

# **Fuel and E.G.R.**

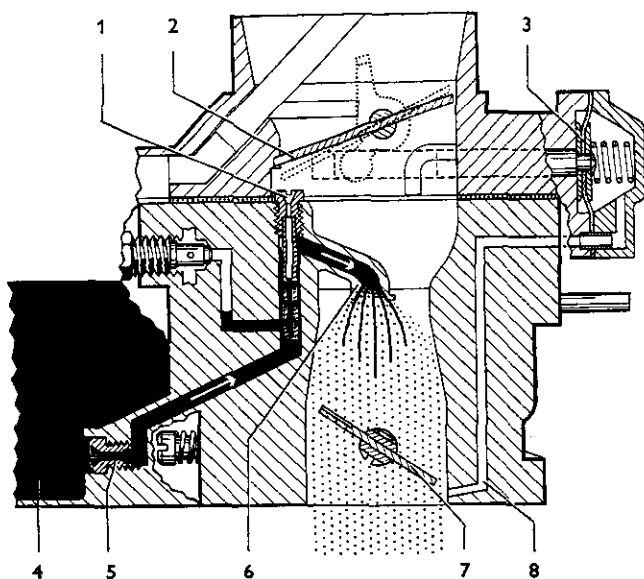
# **System**

- 1.1 Carburetor, E.G.R. Description
- 1.4 Altitude Corrector
- 1.5 Throttle Valve Positioner Rebuild
- 1.6 Fuel Pump
- 2.1 Carburetor Adjustment
- 3.1 Carburetor, Fuel Pump

The function of the carburetor is to prepare a mixture of fuel and air in the right proportion for good engine performance under all conditions of temperature, speed and load. By using the vacuum created by the suction of the pistons in the engine cylinders, various systems within the carburetor become operative and allow fuel and air to flow in different amounts and proportions to suit engine operation.

The automatic choke provides a rich mixture for starting the cold engine. As the engine warms up, the choke valve gradually opens to admit more air and weaken the mixture.

Fuel is supplied to the carburetor by the fuel pump. When the fuel in the float chamber has reached a predetermined level the rising float lifts the float needle until it closes the valve, cutting off the fuel being supplied.



## Automatic choke

Before starting when cold, the throttle valve (7) must be opened by depressing the accelerator pedal briefly once so that the tensioned bimetal spring can close the choke valve (2) via the operating lever. The idle adjusting screw then rests on one of the steps of the fast idle cam and opens the throttle valve a little. When the starter is operated, a vacuum is created which draws fuel from the float chamber (4), through the main jet (5), emulsion tube with air correction jet (1) and the discharge arm (6) into the venturi. The choke valve (2) is opened slightly against the tension of the bimetal spring by the vacuum diaphragm (3).

The vacuum diaphragm (3) is connected by a drilling (8) to the vacuum which is present below the throttle valve and can open the choke valve via the diaphragm rod.

As the bimetal spring heats up, the choke valve opens slowly until after about 2 to 3 minutes it is fully open. When the choke is fully open the throttle stop screw rests on the lowest step of the fast idle cam when the engine is idling.

### Idle operation

When the engine is idling the speed of the air entering the carburetor, and therefore the vacuum in the venturi as well, is not great enough to draw the fuel out of the discharge arm. A high vacuum however is present directly below the closed throttle valve in the carburetor with the bypass air drilling, and the almost closed throttle valve in the standard type carburetor.

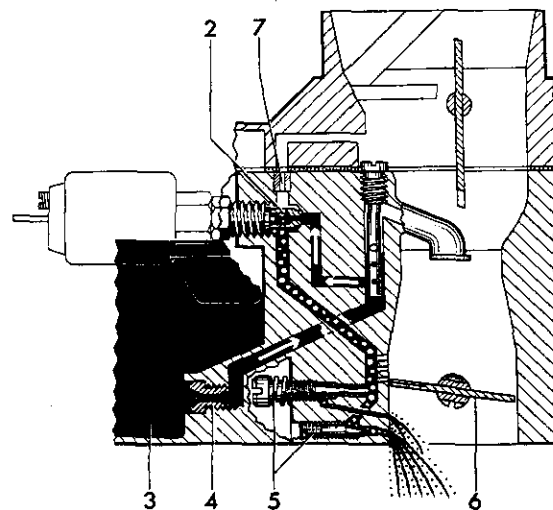
### 30 PICT-2

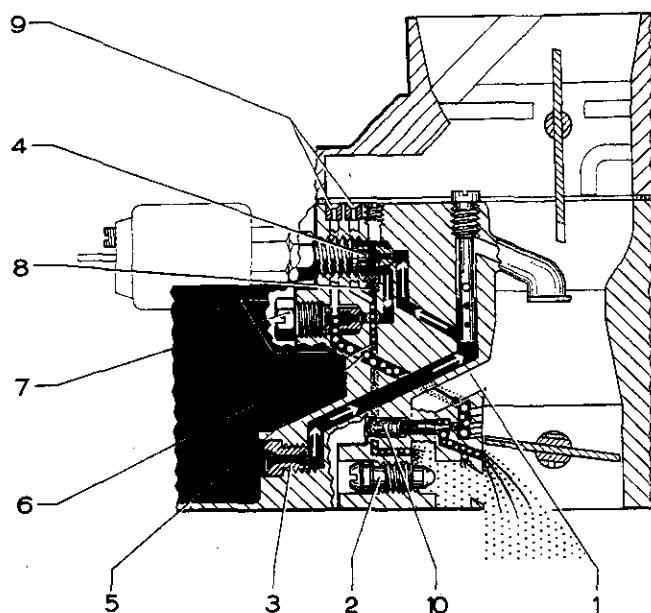
(Carburetor without bypass air drilling)

When idling, the engine receives combustion air through the gap at the more or less closed throttle valve (6). Due to the high vacuum below the throttle valve fuel is drawn through the main jet (4) to the pilot jet (2). Air is metered via a drilling through the pilot air jet drilling (7) into the pilot drilling where it forms an emulsion with the fuel.

The quantity of this emulsion can be adjusted by turning the volume control screw (5) in or out. The idle mixture is formed below the throttle valve from emulsion air being drawn in.

The bypass ports near the throttle valve gap smooth out the transition from the idle to the main jet systems.





## Carburetor with bypass drilling

The air, which is drawn in by the engine during idling, passes through a special drilling on the 30/34 PICT-3 carburetors and bypasses the throttle valve. The bore of this so-called bypass drilling (1) can be altered in size, according to the air requirements of the engine, with the aid of a screw (2). The fuel for idling passes via the main jet (3) to the pilot jet cutoff valve (4). When the ignition is switched on, the path to the two idle drillings (5 and 6) is open. The fuel is metered through the pilot jet (7) in the No. 5 drilling and through the auxiliary fuel jet (8) in the No. 6 drilling. This metered fuel which is mixed with air from the two air drillings (9) passes in part as an emulsion through the drilling (6) directly into the bypass drilling.

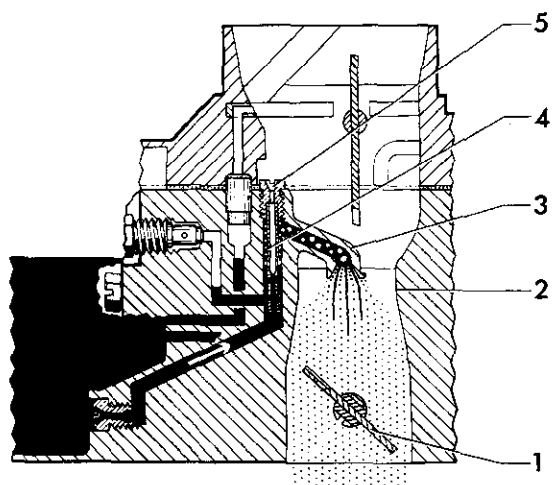
The main portion of the fuel however flows via the drilling (5) where it is metered by the volume control screw (10), to the discharge opening below the throttle valve. The volume control screw (10) is set to a final adjustment by the factory and should not be touched.

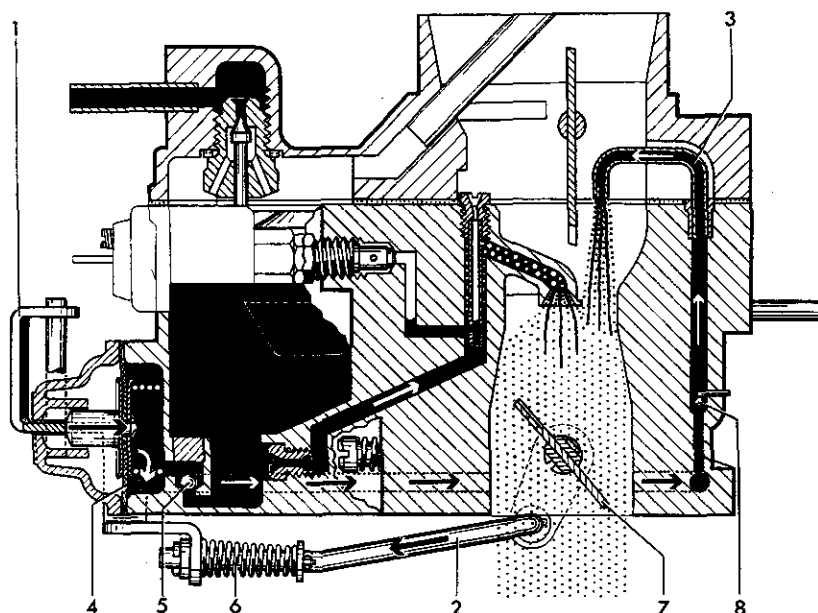
The idle adjustment should only be done by turning the bypass screw (2). The emulsion which flows from the drilling (6) into the bypass drilling ensures that the composition of the fuel mixture and thereby the composition of the exhaust gas remains constant even after the bypass screw has been turned.

### Part throttle operation

The throttle valve (1) is now open. The air which is being sucked in by the cylinders flows from top to bottom through the carburetor. The discharge arm (3) is situated in the narrowest cross section of the venturi (2). At this point, due to the high air speed which is dependent upon the engine speed, there is a more or less high vacuum which draws the premixed fuel/air emulsion from the mixing tube (4) into the intake port.

Air which enters by way of the auxiliary air jet (5) prevents the mixture from becoming too rich during full load operation. It controls the increase of fuel progressively with the increase in engine speed.



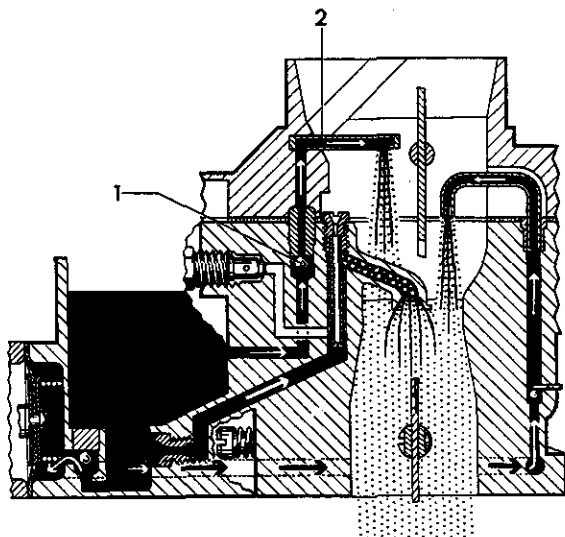


## Accelerator pump

When accelerating from idle speed, the vacuum in the venturi is not high enough to draw the fuel out of the discharge arm due to the drop in vacuum caused by the throttle valve being opened suddenly at low engine speed. To overcome this "flat spot" condition, the accelerator pump injects additional fuel into the mixing chamber. The pump diaphragm (4) is operated by the throttle valve (7) via the pump lever (1) spring (6) and connecting rod (2). The diaphragm draws fuel from the float chamber through the ball

valve (5), and forces it past the check valve (8) through the injection tube (3) into the carburetor mixing chamber. When the throttle valve closes, the accelerator pump is re-filled with fuel.

At the upper end of the engine speed range the vacuum around the injection tube increases to such an extent that additional fuel is drawn out of the float chamber through the accelerator pump.



## Power fuel system

At full throttle and high engine speed, the fuel/air mixture is made even richer to make it possible for the engine to reach its maximum output. The vacuum near the power fuel tube (2) is then so great that additional fuel is drawn from the float chamber via a drilling (1). At lower and intermediate engine speeds, the vacuum is not sufficient to draw fuel through the power fuel tube.

### Note

Solex 30 PICT-2 carburetors for engines in Automatic Stick Shift vehicles have a single vacuum takeoff near the throttle valve for the distributor.

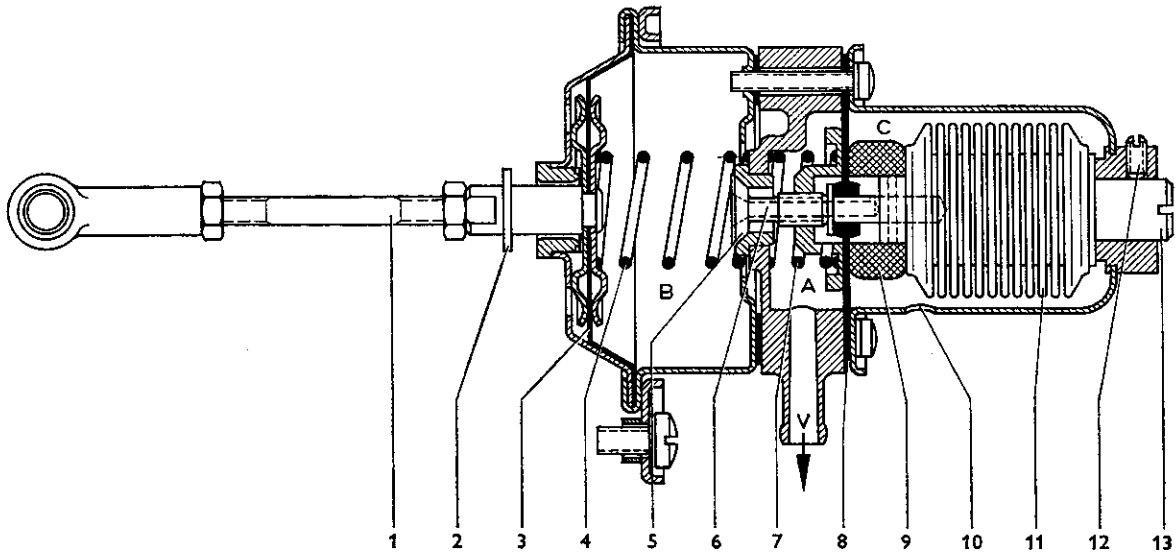
From Eng. No. 5 000 001

The exhaust gas from gasoline engines contains poisonous **carbon monoxide** gas and **hydrocarbons**. The actual amounts of carbon monoxide and hydrocarbons present in the exhaust gas depend to a large extent on the air to fuel ratio of the mixture. The ignition timing, temperature and engine condition are also of some importance. The mixture varies according to the engine operating conditions and this means that the composition of the exhaust gas also varies.

The carburetor and distributor are set so that the proportions of carbon monoxide and hydrocarbon in the exhaust are kept to a minimum.

A throttle valve positioner which opens the throttle valve in accordance with the intake manifold vacuum prevents the proportion of hydrocarbons in the exhaust from increasing when the vehicle is overrunning the engine. Engines of Automatic Stick Shift vehicles have no throttle positioner.

### Throttle valve positioner



The purpose of the throttle valve positioner is to open the throttle slightly when the vehicle is overrunning the engine, thus preventing the intake manifold vacuum from rising as high as it would with a closed throttle. This ensures that, even on deceleration, the engine receives an adequate charge of combustible air-fuel mixture and stops the fuel from passing into the exhaust in an unburnt state. This also prevents backfiring in the muffler.

The vacuum (V) created below the throttle valve on deceleration becomes effective in chamber (A) and pulls diaphragm (8) to the left against the pressure of the spring (7). The valve (5) which is fixed to the diaphragm (8) opens and the vacuum present in chamber (A) becomes effective in chamber (B) and pulls the diaphragm (3) to the right against the pressure of spring (4). This movement is transmitted to the pull rod (1) which opens the throttle valve via the damper lever.

The pull rod stroke is limited by the stop washer (2). When the intake manifold vacuum decreases, the spring (7) presses the diaphragm (8) to the

right, which closes valve (5). The spring (4) can now move the diaphragm (3) to the left because the vacuum in chamber (B) is eliminated via a connection to the atmosphere. The outside air passes through hole (10) into the housing (C) of the altitude corrector, through the plastic foam filter (9) and into chamber (B) via the drilling (6) in valve (5). The altitude corrector (11) is installed with a slight preload and presses on valve (5). The preload varies according to the existing atmospheric pressure.

When the atmospheric pressure is low, and the intake manifold vacuum and thus the opening force exerted by the diaphragm (8) on valve (5) reduced, the preload of the altitude corrector (11) on the valve (5) increases by the same amount so that the operation of the throttle valve positioner is never affected by the actual atmospheric pressure.

The throttle valve positioner can be set with the adjusting screw (13) which is locked with a set screw (12).



## Two-part throttle valve positioner

For California: from Eng. No. B 6 000 002  
For all others: from Eng. No. B 6 000 001  
up to Eng. No. AE 0 627 299 only

The operating part and the control part of the throttle valve positioner are arranged separately. The operating part is located as previously on a bracket on the carburetor flange, while the control part is located at the rear on the left of the engine compartment. The two parts are connected by a hose. In addition the modified throttle valve positioner acts as a closing damper. This prevents the throttle valve from closing immediately on deceleration.

## Dashpot

For California: from Eng. No. AE 0 058 481  
For all others: from Eng. No. AE 0 058 480  
up to Eng. No. AE 0 627 299 only

Vehicles with manual transmission are equipped with a dashpot.

This ensures that the throttle valve does not immediately close when the accelerator pedal is released, i. e. the engine continues running at a fast idling speed until a sufficiently high vacuum is built up and the throttle valve positioner operates.

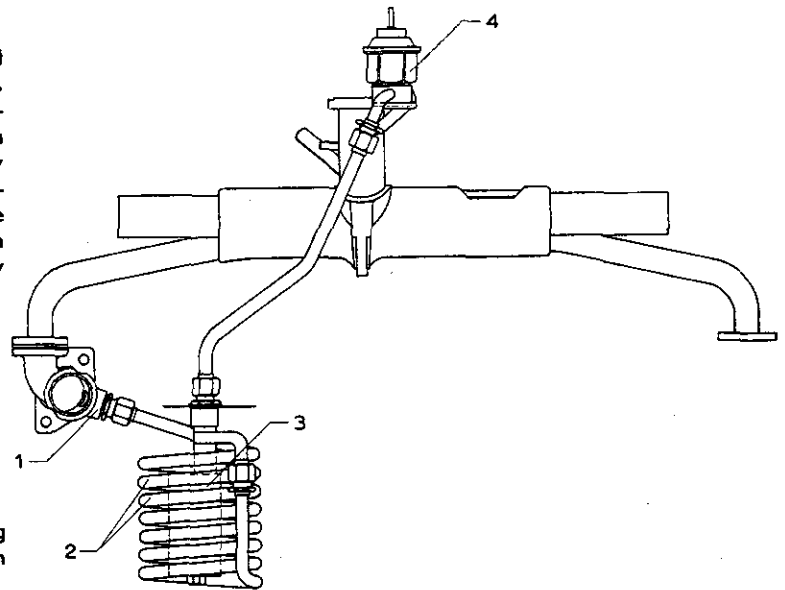
The dashpot is operated through a carrier plate welded to the throttle valve lever.

### Recirculation of Exhaust Gases

For California only from Eng. No. AH 0 000 001

To reduce the oxide of nitrogen emission (NOx), exhaust gas which has been cleaned and cooled is recirculated into the intake system during partial load operation.

Exhaust gas is taken from the left rear exhaust flange (1) and cooled in the cooling coil (2). The coarse impurities are filtered out by a cyclone filter (3). The exhaust gas which has been so prepared passes into the intake manifold by way of the vacuum controlled exhaust recirculating valve (4). This exhaust gas recirculating valve (4) controls the exhaust gas flow dependent on the throttle valve position, so that mixing is only possible during **partial load operations**.



#### Note

From Eng. No. AH 0 005 900

on the Type 1 / Automatic Stick Shift the cooling coil and cyclone filter have been replaced by an element type filter.

|                                                                                                                                                                                                                                                                                                                    |                                                                                               |
|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------------------------------------------------------------------------------|
| <b>Vehicle Type:</b>                                                                                                                                                                                                                                                                                               | Type 1/Model 181                                                                              |
| <b>Engine:</b> Code letter<br>Date introduced<br>Engine No.                                                                                                                                                                                                                                                        | AM<br>1 August 1973<br>AM...                                                                  |
| <b>Carburetor:</b> SOLEX<br>Production<br>Mod. state<br>Spare part No.                                                                                                                                                                                                                                             | 34 PICT-3<br>181 129 027 K<br>VW 404-1<br>181 129 027 K                                       |
| <b>Jets:</b> Venturi dia. mm<br>Main jet<br>Air correction jet<br>Pilot jet<br>Pilot jet air bleed<br>Auxiliary fuel jet<br>Auxiliary air jet<br>Enrichment, without ball<br>Injection quantity cm <sup>3</sup> /stroke<br>Float needle valve (mm)<br>Washer under float needle valve (mm)<br>Float weight (grams) | 26<br>× 127.5<br>75 Z<br>55<br>147.5<br>47.5<br>90<br>2 x 100<br>1.3—1.6<br>1.5<br>0.5<br>8.5 |
| <b>Octane requirement:</b> RON (new rating)                                                                                                                                                                                                                                                                        | 91 (86)                                                                                       |
| <b>Idling:</b> Speed rpm<br>CO value vol. %                                                                                                                                                                                                                                                                        | 800—900<br>1—3                                                                                |

**Note**

When replacing the carburetor see the note in the spare parts list.

# Operation of Altitude Corrector Type 1 **K**

To ensure satisfactory mixture formation in the carburetor at high altitudes, the main jet carrier can be replaced by an altitude corrector with a suitable main jet.

## Note

The jet carrier for altitude correctors of carburetors with main jets on the inside is longer than the altitude corrector shown here.

The main jet carrier is replaced by the altitude corrector which is installed in the same way as the main jet carrier.

At one end of the altitude corrector is the main jet (1) through which the fuel coming from the float chamber via an annular chamber has to flow.

The fuel flows to the main jet through four angled drillings and a small drilling which lies between the main jet and the four angled passages. The fuel also flows into the pressure unit chamber (3).

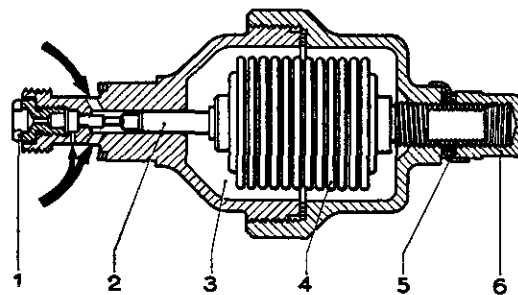
At the end opposite the main jet, the pressure unit is screwed into the housing of the corrector to locate it axially.

The other end of the pressure unit carries the needle (2) which moves freely in the passage leading to the main jet. When the pressure unit (4) expands due to the change in atmospheric pressure at high altitudes, the needle throttles the fuel flow to the main jet to suit the changing conditions.

When the vehicle is operating at sea level, the needle in the corrector moves into a position where it has no influence on fuel consumption.

## Caution

When the altitude corrector is assembled, the pressure unit is set with the regulating nut (6) which is secured by a lock plate (5). This setting must not be altered on any account.



# Exhaust Emission Control System (Types 1 and 2) **K 1.5**

The exhaust gas from gasoline engines contains poisonous **carbon monoxide** gas and **hydrocarbons**. The actual amounts of carbon monoxide and hydrocarbons present in the exhaust gas depend to a large extent on the air to fuel ratio of the mixture. The ignition timing, temperature and engine condition are also of some importance.

The mixture varies according to the engine operating conditions and this means that the composition of the exhaust gas also varies.

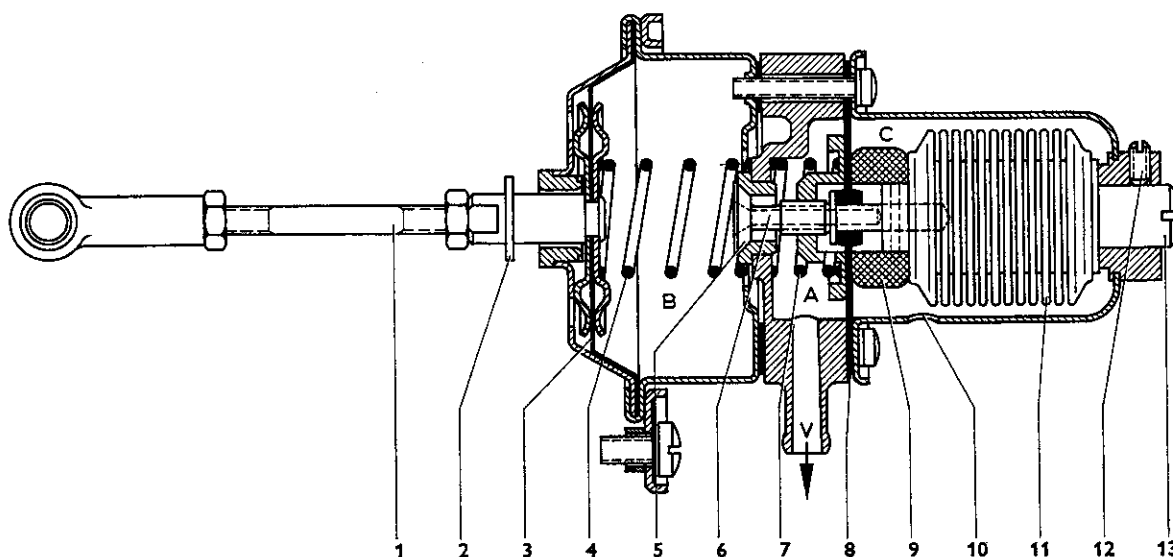
The carburetor and distributor are set so that the proportions of carbon monoxide and hydrocarbon in the exhaust are kept to a minimum.

A throttle valve positioner which opens the throttle valve in accordance with the intake manifold vacuum prevents the proportion of hydrocarbons in the exhaust from increasing when the vehicle is over-running the engine. Engines of VW Automatic vehicles have no throttle positioner.

## Throttle valve positioner

The purpose of the throttle valve positioner is to open the throttle slightly when the vehicle is over-running the engine, thus preventing the intake manifold vacuum from rising as high as it would with a closed throttle. This ensures that, even on deceleration, the engine receives an adequate charge of combustible air-fuel mixture and stops the fuel from passing into the exhaust in an unburnt state. This also prevents backfiring in the muffler.

The vacuum (V) created below the throttle blade on deceleration becomes effective in chamber (A) and pulls diaphragm (8) to the left against the pressure of the spring (7). The valve (5) which is fixed to the diaphragm (8) opens and the vacuum present in chamber (A) becomes effective in chamber (B) and pulls the diaphragm (3) to the right against the pressure of spring (4). This movement is transmitted to the pull rod (1) which opens the throttle blade via the damper lever.



The pull rod stroke is limited by the stop washer (2). When the intake manifold vacuum decreases, the spring (7) presses the diaphragm (8) to the right, which closes valve (5). The spring (4) can now move the diaphragm (3) to the left because the vacuum in chamber (B) is eliminated via a connection to the atmosphere. The outside air passes through hole (10) into the housing (C) of the altitude corrector, through the plastic foam filter (9) and into chamber (B) via the drilling (6) in valve (5). The altitude corrector (11) is installed with a slight preload and presses on valve (5). The preload varies according to the existing atmospheric pressure.

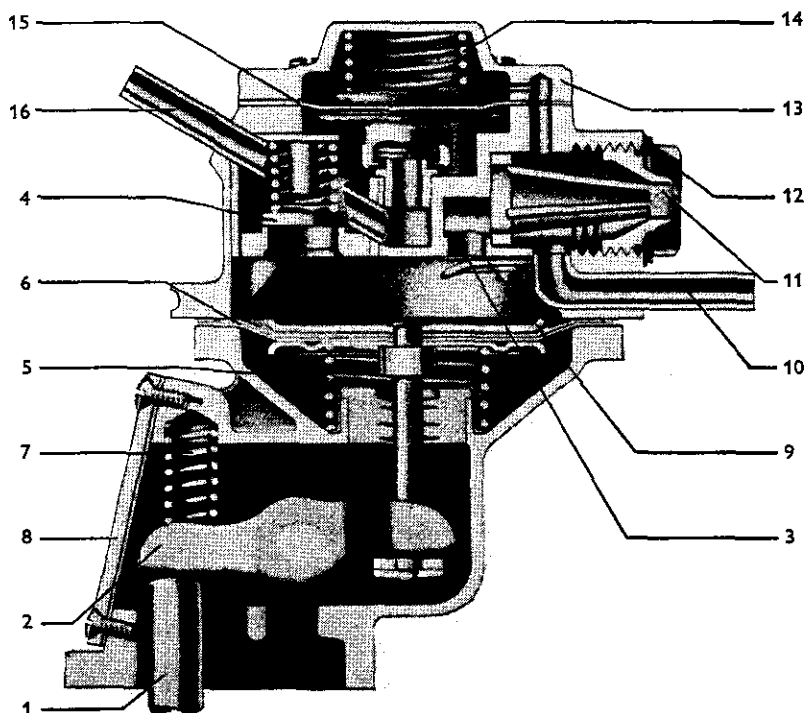
When the atmospheric pressure is low, and the intake manifold vacuum and thus the opening force exerted by the diaphragm (8) on valve (5) reduced, the preload of the altitude corrector (11) on the valve (5) increases by the same amount so that the operation of the throttle valve positioner is never affected by the actual atmospheric pressure.

The throttle valve positioner can be set with the adjusting screw (13) which is locked with a set screw (12).

# Operation of Fuel Pump **K 1.6**

## Fuel pump — Types 1 and 3

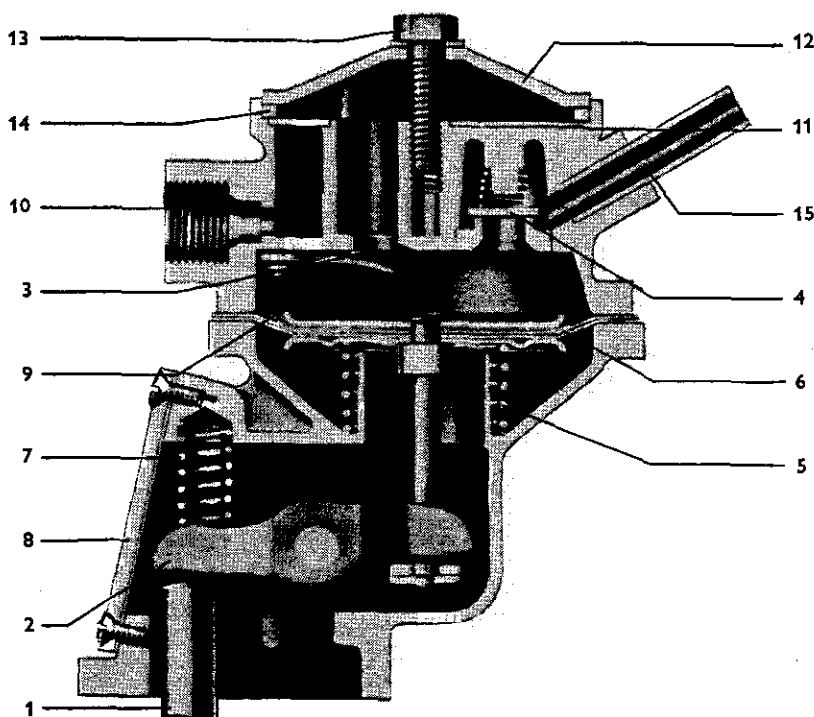
- 1 - Push rod
- 2 - Operating lever
- 3 - Suction valve
- 4 - Pressure valve
- 5 - Diaphragm spring
- 6 - Diaphragm
- 7 - Spring for lever
- 8 - Inspection cover
- 9 - Suction valve retainer
- 10 - Fuel inlet
- 11 - Filter
- 12 - Threaded plug
- 13 - Cover for upper part
- 14 - Spring
- 15 - Cut-off diaphragm
- 16 - Fuel outlet

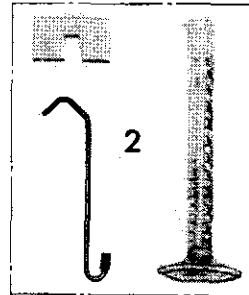
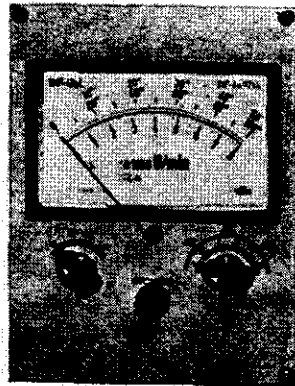


The push rod (1) is operated by the cam on the ignition distributor drive shaft and pulls the diaphragm (6) down by means of the operating lever (2) and the pull rod. This movement creates a vacuum above the diaphragm which draws in fuel through the suction valve (3). When the push rod goes back, the spring (5) pushes the diaphragm up and forces fuel past the pressure valve (4) to the carburetor. There is a cut-off diaphragm (15) installed in the upper part of the fuel pump of Type 1 and Type 3 vehicles that stops the flow of fuel when the engine is stationary.

## Fuel pump — Type 2

- 1 - Push rod
- 2 - Operating lever
- 3 - Suction valve
- 4 - Pressure valve
- 5 - Diaphragm spring
- 6 - Diaphragm
- 7 - Spring for lever
- 8 - Inspection cover
- 9 - Suction valve retainer
- 10 - Fuel inlet
- 11 - Filter
- 12 - Cover
- 13 - Hexagon head screw
- 14 - Sealing ring for cap
- 15 - Fuel outlet



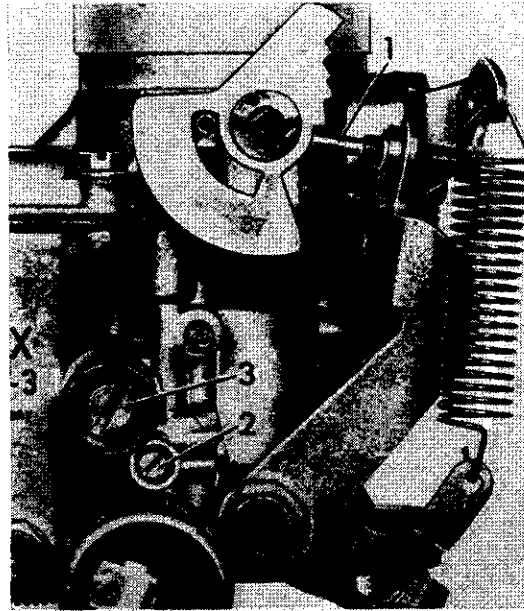


| No. | Description                          | Special tool | Remarks                        |
|-----|--------------------------------------|--------------|--------------------------------|
| 1   | Dwell angle — tachometer tester      |              |                                |
| 2   | Measuring gauge (Injection quantity) | VW 119       |                                |
| 3   | CO-tester                            |              | not shown, local purchase item |

### Idle speed adjustment

(Carburetor with bypass air drilling)

- 1 - Turn idle screw (1) out until there is clearance between screw and fast idle cam.
- 2 - Then turn screw in until it just touches the fast idle cam.
- 3 - From this position turn screw in further  $\frac{1}{4}$  of a turn.
- 4 - Turn volume control screw (2) in slowly until it comes to a stop, and then turn it back 2,5 to 3 complete turns.
- 5 - Attach tachometer and insert thermometer for measuring oil temperature into engine in place of the oil dipstick. Check if the automatic choke is fully open.
- 6 - Start engine and set idle speed (900 rpm) by turning the bypass screw (3).
- 7 - By turning volume control screw adjust to the highest idle speed, then turn back until the engine speed drops by 20—30 rpm.
- 8 - Reset the correct idle speed by turning the bypass screw.





## Measuring and adjusting CO concentration in exhaust gases with a CO tester

### Note

To be able to attain satisfactory exhaust gas composition the engine must be in good condition, the valves and ignition timing be correctly adjusted and there must be no leaks in the muffler.

Depending on CO tester being used, make the necessary engine connections and operate tester according to manufacturer's instructions. Use tachometer for idle adjustment before reading final CO value.

Manual transmission 800— 900 rpm  
Automatic Stick Shift 900—1000 rpm

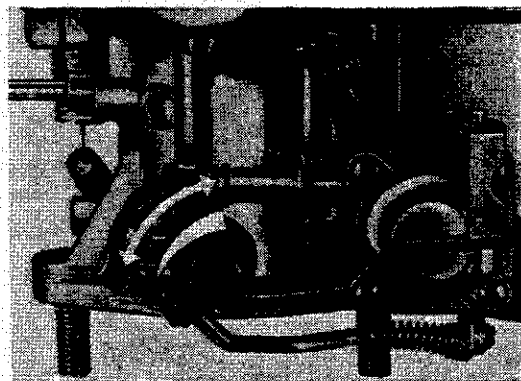
Read CO value and, if necessary turn volume control screw to attain

**$3 \pm 1 \% \text{ CO}$**

Check engine speed again and if necessary adjust.

To eliminate "flat spots" on acceleration, it may be necessary to measure the amount of fuel injected by the accelerator pump and to correct it. With the appliance VW 119 it is possible to measure the injection quantity **on the carburetors on and off the vehicle.**

- 1 - Start engine briefly to ensure that there is sufficient fuel in the carburetor.
- 2 - Remove air cleaner.
- 3 - For carburetors without bypass air drilling only: Turn the idle adjusting screw back until the throttle valve is completely closed.
- 4 - Push the extension pipe over the injection tube in the carburetor.
- 5 - Open the choke valve and lock it in position with the plastic piece.
- 6 - Operate the throttle valve until fuel is ejected from the pipe.
- 7 - Hold glass vial under the pipe and operate the throttle valve rapidly 5 or 10 times.
- 8 - Divide the amount caught by 5 or 10 and compare the figure with the specified figure.
- 9 - If amount differs considerably carry out the following adjustments:
  - a - Install thicker or thinner washers between pump lever and cotter pin.  
If injection quantity is too large — install thinner washers  
if injection quantity is too small — install thicker washers.  
  
Use washers with thickness 0.2 mm (0.007 in.) — Spare part No. 111 905 231.
  - b - Move cotter pin in connecting link; if injection quantity is too large — move cotter pin to outer side  
if injection quantity is too small — move pin to inner side.
  - c - Adjust bell crank lever if injection quantity is too large — adjust in direction (2),  
if injection quantity is too small — adjust in direction (1).
- 10 - Check direction of fuel jet, must be on collar of discharge arm.



Should it be necessary to check the fuel level in the float chamber, proceed as follows:

## Checking

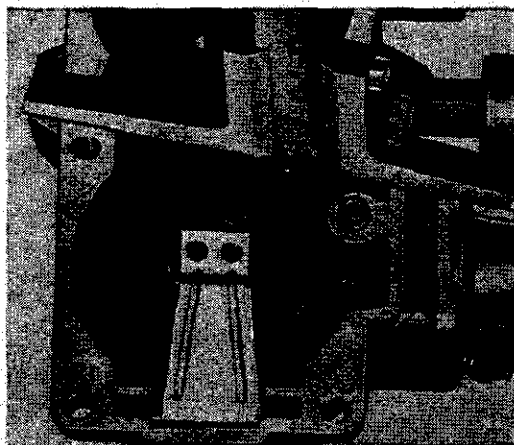
- 1 - Position vehicle on a level surface.
- 2 - Run engine briefly.
- 3 - Pull fuel hose off upper part of carburetor.
- 4 - Take upper part off complete with gasket. Hold feed pipe closed to prevent more fuel flowing into chamber as upper part is lifted.
- 5 - Measure fuel level from body joint with a depth gauge. The depth gauge must be held vertically. Do not measure too near the walls of the body.

The reading is taken when the tip of the gauge just touches the surface of the fuel and should be 12—14 mm (0.47—0.55 in.).

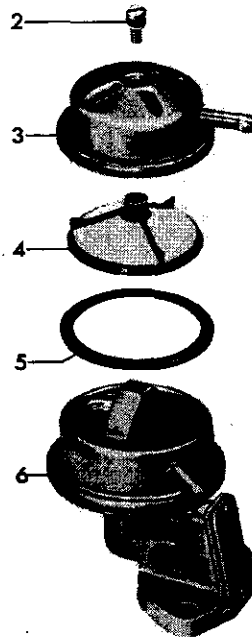
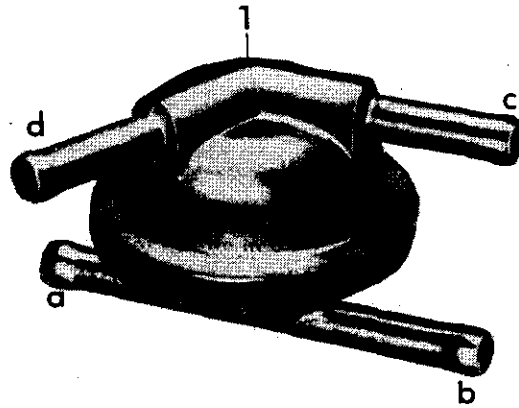
- 6 - If the level is too high, increase thickness of washer under needle valve, if too low, decrease washer thickness.

Washers of the following thicknesses are available:

| Part No.      | Thickness mm (in.) |
|---------------|--------------------|
| 111 129 213 A | 0.5 (0.019)        |
| 111 129 213 B | 0.8 (0.031)        |
| 111 129 213 C | 1.0 (0.039)        |
| 111 129 213 D | 1.5 (0.059)        |



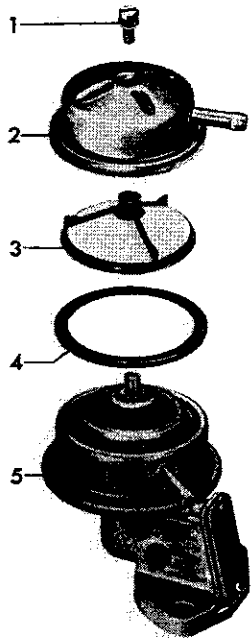
From Engine No. AE 0 058 480  
up to Engine No. AE 0 793 574  
or AH 0 004 173



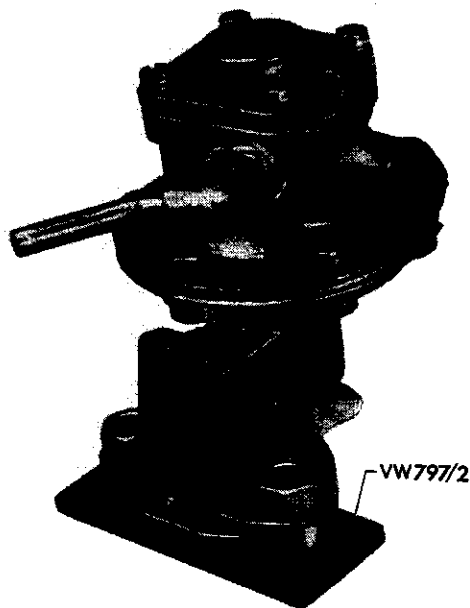
# K Type 1 Repair Instructions

| No. | Description     | Qty. | Note when<br>disassembling | Note when<br>assembling/installing                                                                                                                                            | Special<br>instructions<br>see |
|-----|-----------------|------|----------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------------|
| 1   | Cutoff valve    | 1    |                            | Secure hose connections<br>with clamps.<br>a - from fuel tank<br>b - to the fuel pump<br>(suction pipe)<br>c - from the fuel pump<br>(pressure pipe)<br>d - to the carburetor |                                |
| 2   | Screw           | 1    |                            |                                                                                                                                                                               |                                |
| 3   | Pump upper part | 1    |                            |                                                                                                                                                                               |                                |
| 4   | Fuel strainer   | 1    | Clean and blow out         | When using repair set part<br>No. 111 198 555 B, insert<br>spacer bushing between<br>the filter and the cover                                                                 |                                |
| 5   | Gasket          | 1    | Color: black               | replace                                                                                                                                                                       |                                |
| 6   | Fuel pump       | 1    | Marked with VW 15          | Secure hose connections<br>with clamps                                                                                                                                        |                                |

From Engine No. AE 0 793 575  
or AH 0 004 174

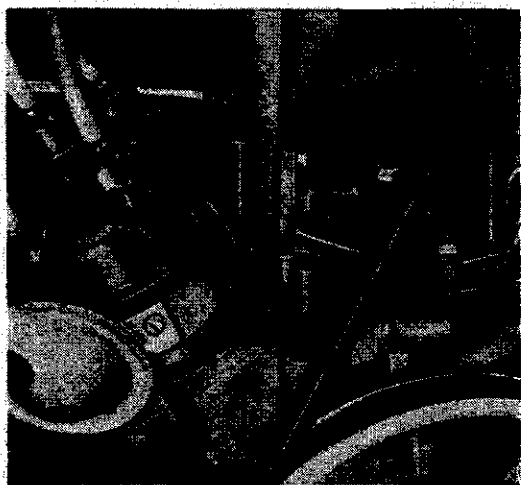


| No. | Description                 | Qty. | Note when             |                                                                                                | Special instructions<br>see |
|-----|-----------------------------|------|-----------------------|------------------------------------------------------------------------------------------------|-----------------------------|
|     |                             |      | disassembling         | assembling                                                                                     |                             |
| 1   | Screw                       | 1    |                       |                                                                                                |                             |
| 2   | Pump upper part             | 1    |                       |                                                                                                |                             |
| 3   | Fuel strainer               | 1    | Clean and blow out    | When using repair set part<br>No. 111 198 555 B,<br><b>do not</b> insert the spacer<br>bushing |                             |
| 4   | Gasket                      | 1    | Color: grey           | replace                                                                                        |                             |
| 5   | Fuel pump with cutoff valve | 1    | Marked with PE 20 000 | Secure hose connections<br>with clamps                                                         |                             |



## Installing diaphragm

Tighten VW 797/2 with two nuts. The operating lever is pressed in 13 mm (0.5 in.) (from pump flange) to move the diaphragm into the correct position. Tighten screws holding upper part.



## Installing fuel pump

Check pump push rod stroke: At the highest point, the push rod should project 13 mm (0.5 in.). If necessary, this dimension should be altered by fitting suitable gaskets.

## Caution

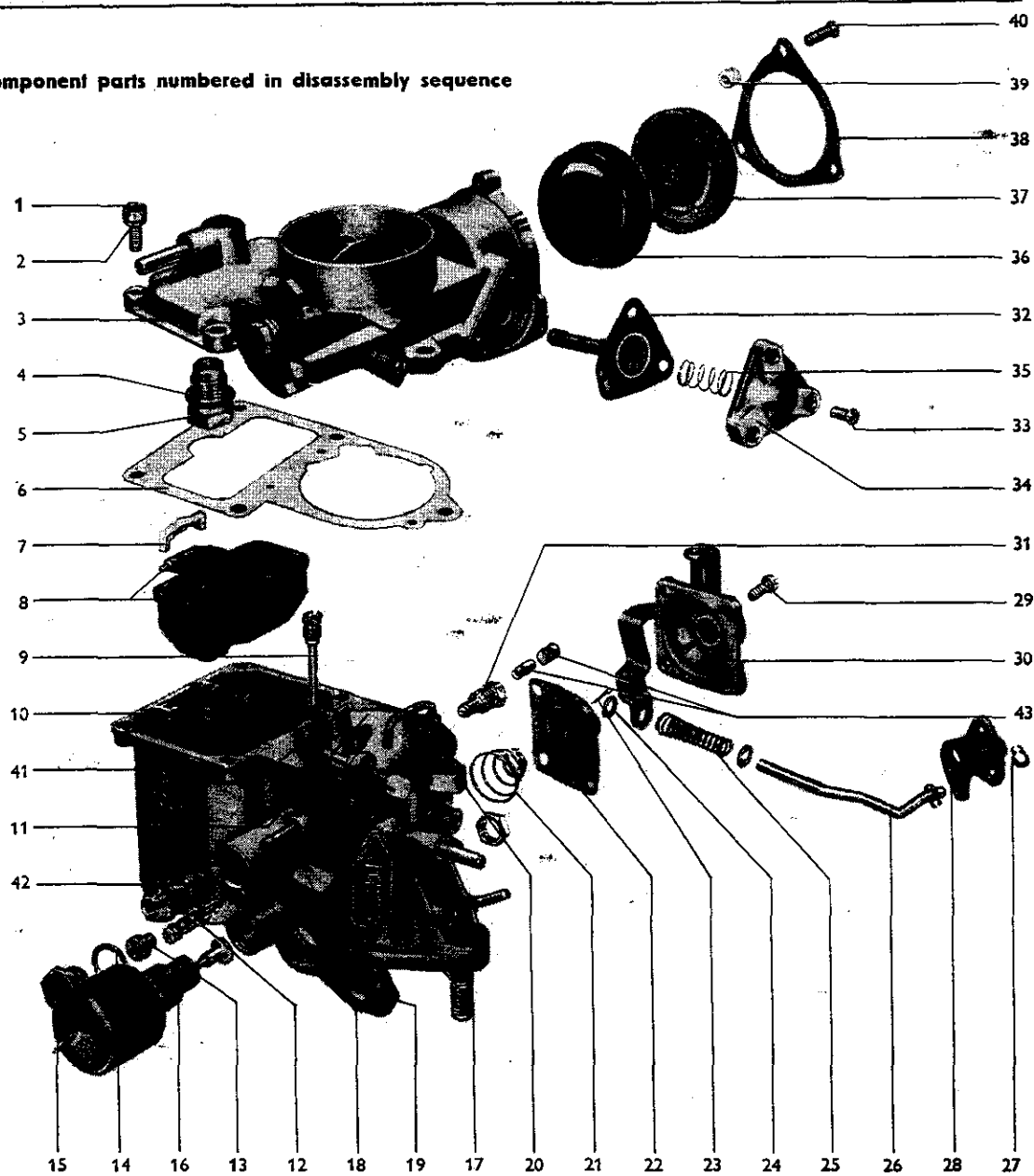
Secure hose connections with clamps.

| No. | Description                          | Qty. | disassembling                | Note when assembling                               | Special instructions see |
|-----|--------------------------------------|------|------------------------------|----------------------------------------------------|--------------------------|
| 28  | Screw                                | 2    |                              | move pump lever to "pressure stroke", then tighten |                          |
| 29  | Pump cover                           | 1    |                              |                                                    |                          |
| 30  | Pilot jet                            | 1    |                              |                                                    |                          |
| 31  | Cutoff valve for bypass mixture      | 1    |                              | note voltage                                       |                          |
| 32  | Vacuum diaphragm                     | 1    |                              |                                                    |                          |
| 33  | Screw                                | 3    |                              |                                                    |                          |
| 34  | Vacuum diaphragm cover               | 1    | note installation position   |                                                    |                          |
| 35  | Vacuum diaphragm spring              | 1    |                              |                                                    |                          |
| 36  | Cap (plastic)                        | 1    |                              | cap lug must engage in housing notch               |                          |
| 37  | Cover with spring and heater element | 1    | from August 1971 marking: 60 | middle mark must be in position with housing mark  |                          |
| 38  | Retaining ring                       | 1    |                              |                                                    |                          |
| 39  | Spacer for cover                     | 3    |                              |                                                    |                          |
| 40  | Screw for retaining ring             | 3    |                              |                                                    |                          |



# K Type 1 Repair Instructions

Component parts numbered in disassembly sequence



| No. | Description                     | Qty. | Note when<br>disassembling | Note when<br>assembling                                      | Special<br>instructions<br>see |
|-----|---------------------------------|------|----------------------------|--------------------------------------------------------------|--------------------------------|
| 1   | Screw for upper carburetor part | 5    |                            | tighten evenly, but do not overtighten                       |                                |
| 2   | Spring washer                   | 5    |                            |                                                              |                                |
| 3   | Carburetor upper part           | 1    |                            | power fuel systems differ, secure hose connection with clamp |                                |
| 4   | Washer for float needle valve   | 1    |                            | note washer thickness                                        |                                |
| 5   | Float needle valve              | 1    |                            | check                                                        |                                |
| 6   | Gasket                          | 1    |                            | replace                                                      |                                |
| 7   | Retainer for float pin          | 1    |                            |                                                              |                                |
| 8   | Float and pin                   | 1    |                            | check weight                                                 |                                |

4 - Check float needle valve for leakage. It should not be possible to blow air through the valve when the needle is pressed lightly onto its seat. Check that needle moves freely and note thickness of washer under valve.

5 - Place float in hot water and check for leaks. If bubbles appear, replace the float.

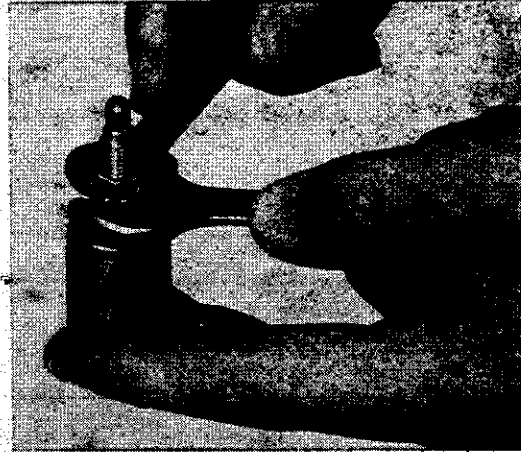
6 - Checking and disassembling the electromagnetic pilot jet cutoff valve:

a - For cleaning purposes, the pilot jet can be screwed off the cutoff valve with two wrenches and blown out.

b - The valve can be checked by switching current off and on and listening for the ticking noise which indicates that valve is moving in and out.

**Note**

If solenoid is defective, the valve can be opened and held in position by means of the small set screw.



7 - Carburetor bodies with worn choke valve and throttle valve bearings should be replaced.

8 - Oil all bearing points on carburetor lightly. The bearings and ball joints of the linkage should be lubricated with a molybdenum disulfide based paste.

9 - Replace plugs which are loose. Spare part No. 113 129 119 A.

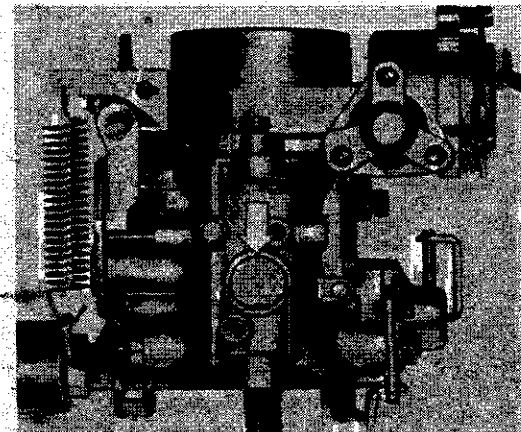
**Repair instructions**

a - Remove all burrs from the drilling.

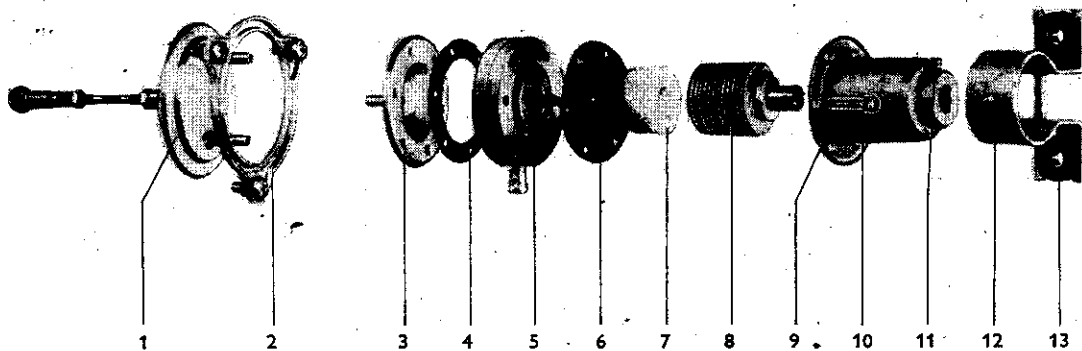
b - Lightly coat the sealing face of the plug with D 3 compound.

c - Install the plug so that the groove is at the bottom (arrow).

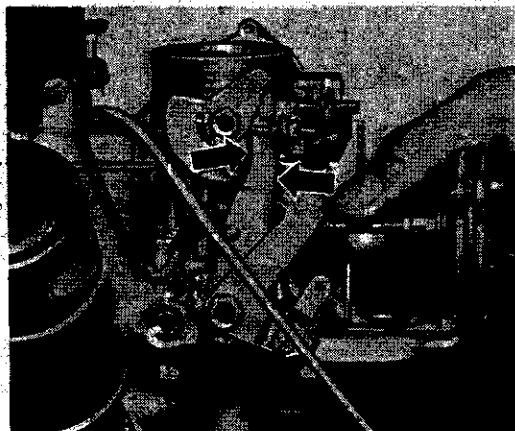
d - Expand the plug by peening.



# K Type 1 Repair Instructions



| No. | Description                | Qty. | Note when<br>disassembling | Note when<br>assembling          | Special<br>instructions<br>see |
|-----|----------------------------|------|----------------------------|----------------------------------|--------------------------------|
| 1   | Operating part             | 1    |                            |                                  |                                |
| 2   | Retaining ring             | 1    |                            |                                  |                                |
| 3   | Control part cover         | 1    |                            | connection to operating<br>part  |                                |
| 4   | Gasket                     | 1    |                            | replace                          |                                |
| 5   | Control part               | 1    |                            | connection to vacuum<br>drilling |                                |
| 6   | Control diaphragm          | 1    |                            |                                  |                                |
| 7   | Plastic foam filter        | 1    |                            |                                  |                                |
| 8   | Altitude corrector         | 1    |                            |                                  |                                |
| 9   | Altitude corrector housing | 1    |                            |                                  |                                |
| 10  | Phillips screw             | 6    |                            |                                  |                                |
| 11  | Set screw                  | 1    |                            |                                  |                                |
| 12  | Clamp                      | 1    |                            |                                  |                                |
| 13  | Rubber mounting            | 1    |                            |                                  |                                |



## Note

When installing a new throttle valve positioner, the pull rod must be adjusted. The special lever must not touch the carburetor body or the throttle valve lever when the throttle valve is closed (see arrows).

See page 2.1/4-1  
Adjusting throttle valve positioner.

| No. | Description                           | Qty. | disassembling | Note when assembling                                                                                                                                                                                                           | Special instructions see |
|-----|---------------------------------------|------|---------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|--------------------------|
| 9   | Air correction jet with emulsion tube | 1    |               | note size                                                                                                                                                                                                                      |                          |
| 10  | Carburetor lower part                 | 1    |               | if damaged replace with new carburetor                                                                                                                                                                                         |                          |
| 11  | Auxiliary air drilling                | 1    |               | note adjustment instructions                                                                                                                                                                                                   |                          |
| 12  | Volume control screw                  | 1    |               |                                                                                                                                                                                                                                |                          |
| 13  | Main jet                              | 1    |               | note size                                                                                                                                                                                                                      |                          |
| 14  | Washer for plug                       | 1    |               |                                                                                                                                                                                                                                |                          |
| 15  | Plug                                  | 1    |               |                                                                                                                                                                                                                                |                          |
| 16  | Bypass air cutoff valve               | 1    |               | with current applied to the grounded valve, the valve core pulls in after slight finger pressure is applied to the core<br><b>Note</b><br>Finger pressure is necessary, since this pressure also exists on an installed valve. |                          |
| 17  | Return spring                         | 1    |               |                                                                                                                                                                                                                                |                          |
| 18  | Fast idling lever                     | 1    |               |                                                                                                                                                                                                                                |                          |
| 19  | Throttle valve lever with stop screw  | 1    |               |                                                                                                                                                                                                                                |                          |
| 20  | Injection tube for accelerator pump   | 1    |               | jet direction on collar of discharge arm                                                                                                                                                                                       |                          |
| 21  | Spring for diaphragm                  | 1    |               |                                                                                                                                                                                                                                |                          |
| 22  | Accelerator pump diaphragm            | 1    |               |                                                                                                                                                                                                                                |                          |
| 23  | Cotter pin 1.5 x 15                   | 1    |               |                                                                                                                                                                                                                                |                          |
| 24  | Washer 4.2                            | 2    |               | thickness: 1 mm (0.04 in.)                                                                                                                                                                                                     |                          |
| 25  | Spring for connecting rod             | 1    |               |                                                                                                                                                                                                                                |                          |
| 26  | Connecting rod                        | 1    |               |                                                                                                                                                                                                                                |                          |
| 27  | Circlip                               | 2    |               | the connecting rod must have 0.3—0.5 mm (0.012—0.02 in.) axial play at the throttle lever                                                                                                                                      |                          |
| 28  | Bell crank lever (adjustable)         | 1    |               |                                                                                                                                                                                                                                |                          |
| 29  | Screw                                 | 4    |               | set pump lever to "pressure stroke" and then tighten screw                                                                                                                                                                     |                          |
| 30  | Pump cover                            | 1    |               |                                                                                                                                                                                                                                |                          |
| 31  | Pilot jet                             | 1    |               |                                                                                                                                                                                                                                |                          |
| 32  | Vacuum diaphragm                      | 1    |               |                                                                                                                                                                                                                                |                          |
| 33  | Screw                                 | 3    |               |                                                                                                                                                                                                                                |                          |
| 34  | Cover for vacuum diaphragm            | 1    | note position |                                                                                                                                                                                                                                |                          |
| 35  | Spring for vacuum diaphragm           | 1    |               |                                                                                                                                                                                                                                |                          |
| 36  | Plastic cap                           | 1    |               | cap lug must engage in the housing notch                                                                                                                                                                                       |                          |
| 37  | Cover with spring and heater element  | 1    |               | middle mark must be in position with housing mark                                                                                                                                                                              |                          |
| 38  | Retaining ring                        | 1    |               |                                                                                                                                                                                                                                |                          |
| 39  | Spacer for retaining ring             | 3    |               |                                                                                                                                                                                                                                |                          |
| 40  | Screw for retaining ring              | 3    |               |                                                                                                                                                                                                                                |                          |
| 41  | Pilot jet air bleed                   | 1    |               |                                                                                                                                                                                                                                |                          |
| 42  | Air bypass screw                      | 1    |               |                                                                                                                                                                                                                                |                          |
| 43  | Auxiliary fuel jet and plug           | 1    |               |                                                                                                                                                                                                                                |                          |

### Removing and installing

#### Caution

Before you start working disconnect the battery ground strap.



Secure accelerator cable as follows: With accelerator pedal in full throttle position, there must be a gap between throttle valve lever and its stop on carburetor body:

$$"a" = 1-1.5 \text{ mm (0.039-0.058 in.)}$$

#### Caution

Always secure hose connections with clamps.

### Repair instructions

The following instructions are valid for all carburetors.

- 1 - Wash all parts, with the exception of the automatic choke cover, in fuel. Sticky deposits in the automatic choke housing can be removed with acetone. Check that the vacuum piston for the automatic choke moves freely.
- 2 - Blow out jets, valves and drillings with compressed air. Never attempt to clean jets with pins or pieces of wire.

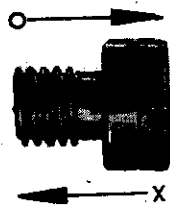
When replacing jets, floats or other parts, use only parts marked "SOLEX".

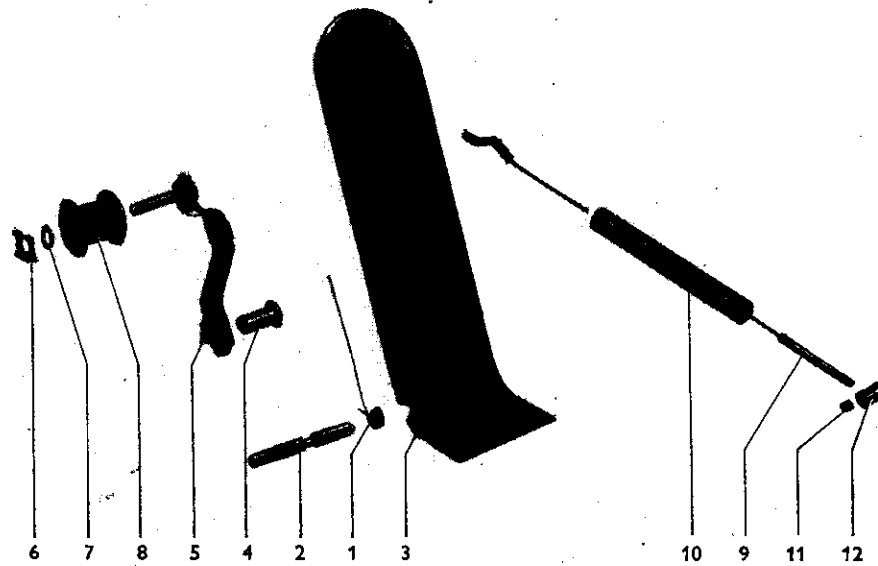
Note jet flow directions.

Jets marked **O** 120 (for example) have flow direction **O**

Jets marked **X** 120 (for example) have flow direction **X**

- 3 - Replace all gaskets and sealing washers.





| No. | Description                         | Qty. | disassembling         | Note when assembling              | Special instructions see |
|-----|-------------------------------------|------|-----------------------|-----------------------------------|--------------------------|
| 1   | Accelerator pedal return spring     | 1    |                       |                                   |                          |
| 2   | Accelerator pedal mounting pin      | 1    |                       |                                   |                          |
| 3   | Accelerator pedal with rubber cover | 1    |                       |                                   |                          |
| 4   | Pin 8 x 18                          | 1    |                       |                                   |                          |
| 5   | Accelerator cable connecting lever  | 1    |                       |                                   |                          |
| 6   | Clip for roller                     | 1    |                       |                                   |                          |
| 7   | Washer 6.4                          | 1    |                       |                                   |                          |
| 8   | Roller for accelerator pedal        | 1    |                       |                                   |                          |
| 9   | Accelerator cable                   | 1    | pull out toward front | lubricate and note length, adjust |                          |
| 10  | Accelerator cable protective tube   | 1    |                       |                                   |                          |
| 11  | Set screw M 5 x 5                   | 1    |                       |                                   |                          |
| 12  | Swivel pin                          | 1    |                       |                                   |                          |

#### Note

Lubricate all moving parts with multi-purpose grease.



Subject:

Exhaust Gas Recirculation

Type/Model:

1

see  
workshop  
manual

All Type 1 vehicles are now equipped with an exhaust gas recirculation system. The following table shows the various versions.

| Type                            | Vacuum dependent exhaust recirculation | Exhaust recirculation according to throttle valve setting | Exhaust recirculation valve |         | Throttle in the valve feed line | Remarks   |
|---------------------------------|----------------------------------------|-----------------------------------------------------------|-----------------------------|---------|---------------------------------|-----------|
|                                 |                                        |                                                           | 1 stage                     | 2 stage |                                 |           |
| 1                               | X                                      |                                                           | X                           |         | X                               |           |
| 1/Automatic Stick Shift         | X                                      |                                                           | X                           |         |                                 | as before |
| 1/Model 181                     | X                                      |                                                           | X                           |         |                                 | as before |
| 1/California                    | X                                      |                                                           |                             | X       | X                               |           |
| 1/Autom. Stick Shift-California | X                                      | X                                                         |                             | X       |                                 |           |
| 1/Model 181 - California        | X                                      |                                                           |                             | X       | X                               |           |

Maintenance: every 24,000 miles replace filter element.

Checking exhaust gas recirculating valve

1 - Run engine at idling speed.

2 - Pull vacuum hose off exhaust gas recirculating valve. Install black hose from intake air preheating temperature regulator in its place.

A noticeable drop in engine speed, or stalling of the engine indicates that exhaust gases are being fed back.

If the engine speed does not change at all, either the valve or the hose is blocked.

of 1 October 1973

see  
workshop  
manual



N o t e

The function of the exhaust re-circulating valve can be checked on engines with 2 stage valves without changing the hoses over. The pin (arrow) on these valves is visible and can be observed if it operates depending on engine speed.

Caution

The 2 stage valves may only be replaced together with the feed line.

Checking the switch on the throttle valve shaft and two-way valve

- 1 - Run engine at idling speed.
- 2 - Operate the switch by hand.  
Engine speed must drop noticeably or stall. If there is no change in engine speed, there is a fault at the switch, two-way valve or in the electrical system.

Adjusting the switch on the throttle valve shaft

The switch is to be adjusted with the special protractor (see W.B.-M). Starting with a closed throttle valve at 0° it switches at 12° and 72° with an audible click.

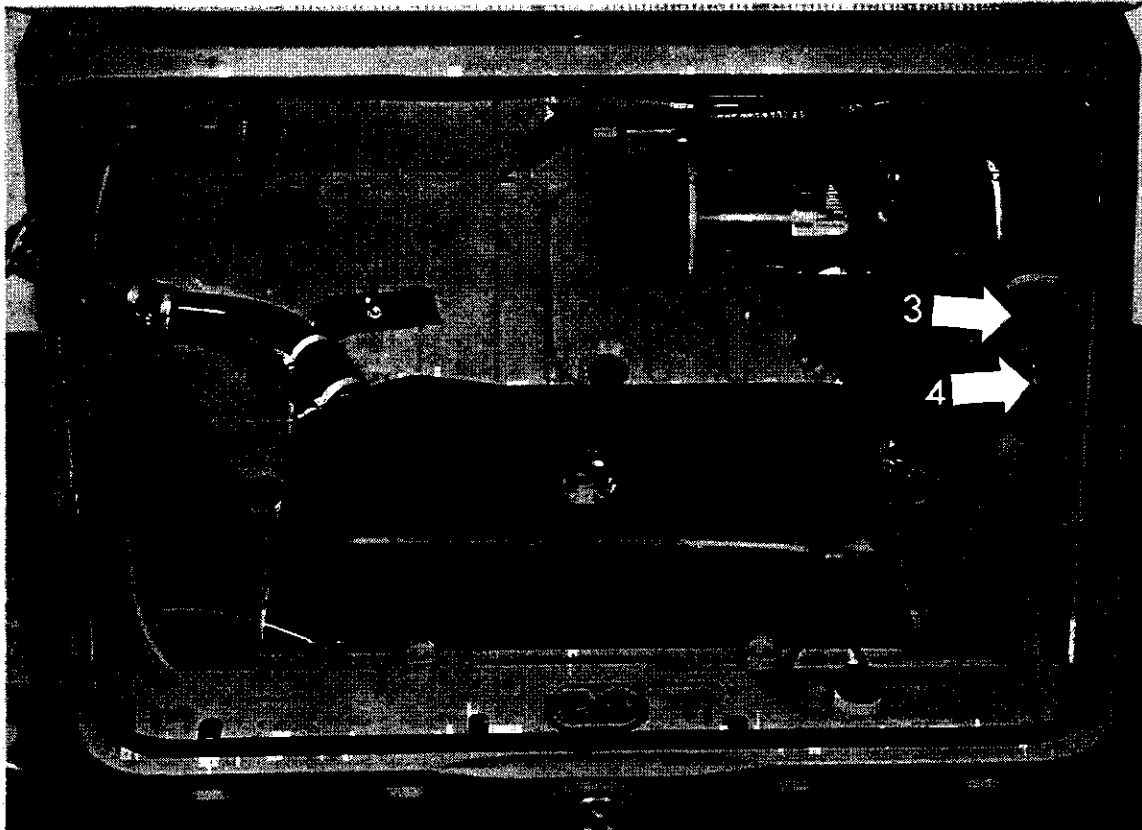


of 2 April 1973

see  
workshop  
manual

#### 4 - Activated charcoal filter system

The expansion chamber is mounted on the left side in the luggage compartment, while the activated charcoal filter container is attached to the frame above the rear axle.



- 1 - Breather and return hose
- 2 - Hose to expansion chamber
- 3 - Expansion chamber
- 4 - Hose to activated charcoal filter



of 2 April 1973

Subject:

Fuel system

Type/Model:

1/Model 181

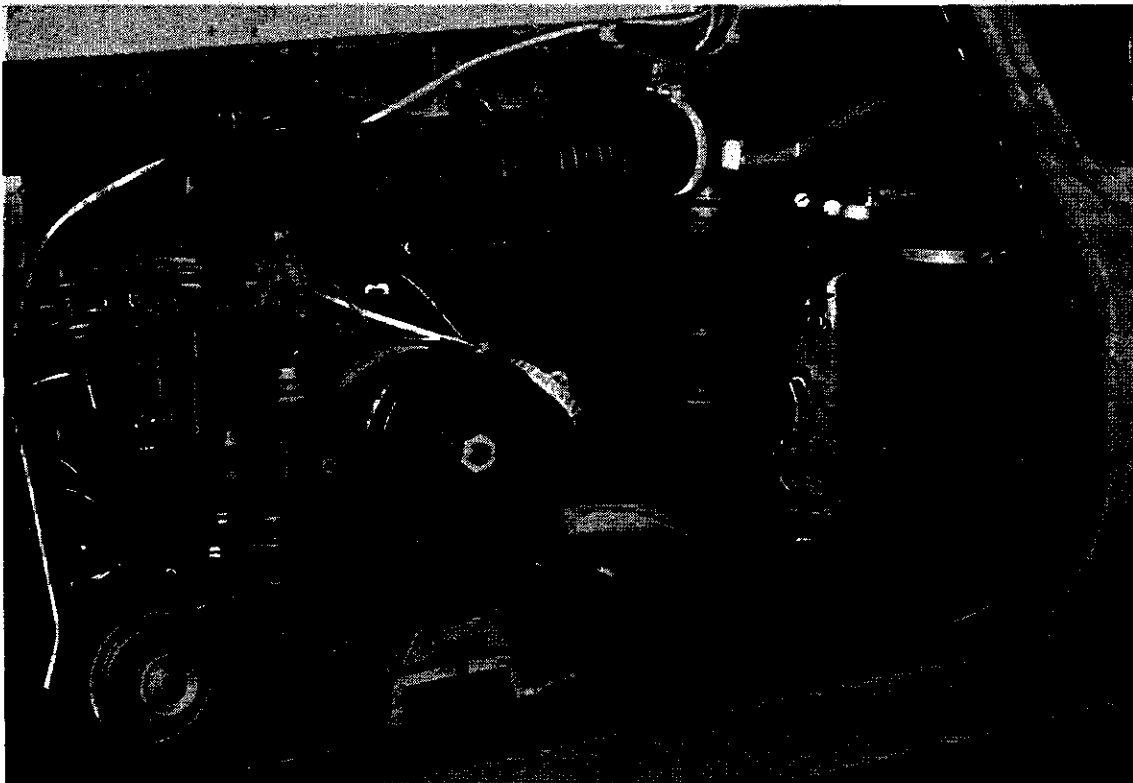
see  
workshop  
manual

The fuel system is basically the same as on the Type 1 / Sedans.  
Note the following differences:

- 1 - Carburetor SOLEX 34 PICT-3 with jet sizes to suit Model 181 and a dash pot, but without a throttle valve positioner.
- 2 - Exhaust recirculation system.
- 3 - Oilbath air cleaner mounted on the right side in the engine compartment.
- 4 - Position of activated charcoal filter.

Note

For description of the engine see Workshop Bulletin  
M of 2 April 1973.



**Model** **Type 1 / Model 181**

|            |                    |               |
|------------|--------------------|---------------|
| Carburetor | SOLEX              | 34 PICT-3     |
|            | Standard           | 181 129 027 K |
|            | Modification state | VW 404-1      |
|            | Spare part No.     | 181 129 027 K |

|                  |     |    |
|------------------|-----|----|
| Octane<br>rating | ROZ | 91 |
|------------------|-----|----|

**Dash pot adjustment:** With dash pot in fully closed position the gap between the plunger and throttle lever must be 1.0 mm (0.04 in.)

Under partial throttle position the system operates basically as on Type 1 / Automatic Stick Shift. The exhaust gas is drawn from the left side muffler only and passes a filter before entering the intake manifold. Depending on the vacuum in the carburetor it is controlled by a valve. Maintenance see W.B. K of 7 September 1972.

**Capacity:** 0.6 liter (1.25 US pt)  
(1.0 Imp. pt)

2



Subject:

Modifications to fuel system

Type/Model:

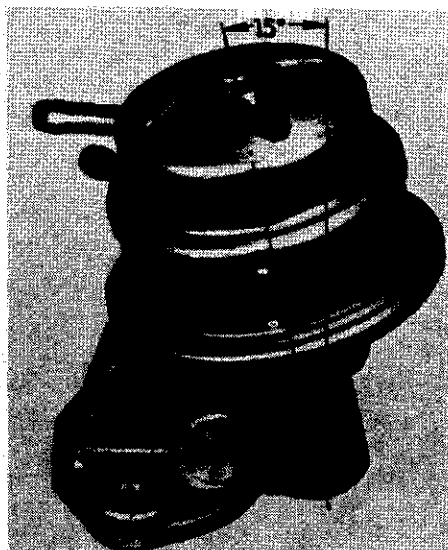
1

see  
workshop  
manual**1 - Modifications to fuel system with alternator**

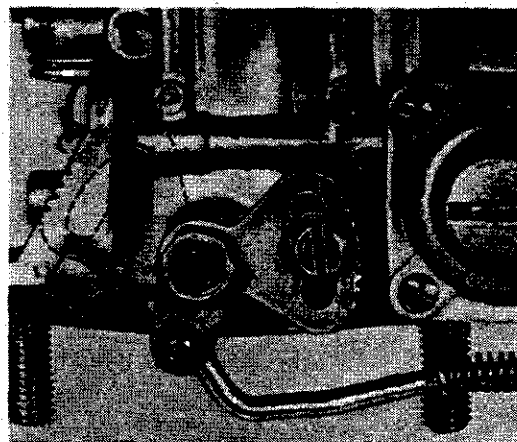
With the installation of an alternator, the fuel system has had to be modified as follows:

a - Pump inclined  $15^{\circ}$  to the left.

b - Pump push rod length:  
100 mm (3.937 in.)  
previously:  
108 mm (4.252 in.)



c - Carburetor with modified accelerator pump linkage (the adjusting segment is towards the accelerator pump).

**2 - Throttle valve positioner****California only**

The throttle valve positioner has been discontinued on Type 1 vehicles with manual transmission for California. The dash-pot remains.